THESIS

THE DEVELOPMENT OF BLENDED LEARNING IN PLANTS MATERIAL FOR GRADE X SENIOR HIGH SCHOOL

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2020

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Submitted to Faculty of Mathematics and Natural Science Universitas Negeri Makassar to fulfill one of the requirements to obtain a Bachelor of Biology Education

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2020

DECLARATION

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I declare sincerely that this thesis summary originally belongs to my own work and not belongs to other researcher for different degree. Furthermore, this thesis summary is not a work published before, except some parts with their original references. Otherwise, if it is found that this thesis summary is plagiarism, I'm ready to be ceased academically.

Makassar, 6 August 2020

Researcher,

(Muh. Ikram Hadi Putra)

LEGALITY PAGE

This thesis is submitted by Muh. Ikram Hadi Putra, Registered Number 1314440011 entitled The Development of Blended Learning in Plants Material for Grade X Senior High School, had been defended in front of the committee of examiners, (SK. No. 3715/UN36.1/TU/2020), date August 6th 2020 and declared to be accepted as part of the requirements for the degree of Bachelor of Education in Study Program Biology Education, Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar on Thursday August 6th 2020.

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ABSTRACT

The aim of this study was to develop a blended learning in plants material that were valid and practical. The result products were learning device consist of syllabus, lesson plans, student worksheet, and e-learning based schoology. The research was a research and development (R&D) by adopting the 4D model. The validity test was based on the assessment result of 2 expert validators, while the practical test based on usage response of blended learning at SMA Negeri 21 Makassar by 1 biology teacher and 33 students as the research subject. The data collection technique used were preliminary observation, interviews, and questionnaires. The research data analysis shows that the developed blended learning was valid, while teachers and students also showed a positive response to blended learning. They consider that the development of blended learning was practical and feasible to be applied in the learning system.

Keywords: *learning process, blended learning, learning device, e-learning, schoology.*

DEDICATION

This summary thesis dedicated to a special person in my life. First to my parents, my father Drs. H. Muh. Tahir Ali, S.H., M.Si., a sincere loving man and my mother Dra. Hj. Darmawati, M.Pd., who has given birth, cared for, raised and always accompanied the author with her prayer. Thank you for all the reinforcements given to me. Second to my sisters Ika Amila Citra, S. Farm., Apt., M.Kes., Dwi Rezki Wahyuni, S.Hi., M.H., Tri Utami Handayani, S.Kom., dr. Nurul Hikmah Pratiwi, and Nur Ismi Nilasari thank you for all forms of prayer and support. And to my family who always gave me sincere advice, motivation, and prayer. Third to my best friend who has always been present and encouraging since junior days Murni Katenni, Nur Fajriaty Ahsan, Andi Huzaimah Zahwa Nursyahbani. Thank you for always been together, strengthen each other, even though sometimes quarrels and then make up. Thank you for giving color in my university life. Hopefully we can all pursue our dreams of getting a bachelor's degree.

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As a human being with the of limitations, many obstacles that the author faced in the preparation of this thesis. However, thanks to the grace of Allah S.W.T and support from various parties, this thesis can be completed. Therefore, on this occasion the author expressed the gratitude and appreciation to all parties for the support both directly and indirectly.

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The author always expects constructive advice so that the author can work better in the future. Hopefully this thesis can benefit all who need it. Amen Ya Rabbal Alamin.

Makassar, August 2020

Author

Muh. Ikram Hadi Putra

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I
INTRODUCTION

The development of the education curriculum is currently being directed to the Curriculum 2013, which is a curriculum oriented towards the achievement of competencies by strengthening the learning process and authentic assessment to achieve competencies of attitudes, knowledge and skills (Sulvianti et al., 2014). Based on the objectives of curriculum 2013 that refers to the achievement of competencies in learning students, then in the Curriculum 2013 required the existence of facilities and infrastructure that can support the success of the learning process in the classroom, namely by planning a developing learning media in accordance with the development of the curriculum.

Learning media develops in line with the development of information and communication technology that takes place very quickly, thus changing the mindset of the community in finding and obtaining information. The existence of internet-based learning media implemented in schools is expected so that students can get the maximum learning experience through a structured learning process and still be accompanied by teachers.

One of the learning media based on integrated internet and computer technology that can be used as a support for existing media in the form of e-learning is a learning that carried out by utilizing the functions of the internet in learning activities by making electronic facilities as learning media. The learning process carried out through the internet means that e-learning allows the delivery of teaching materials to students using information technology media in the form of computers and connected to the internet network.

According to Lestari & Susanti (2016), combining face-to-face learning strategies with e-learning based learning strategies is called blended learning. Blended learning is a learning strategy that combines several learning methods at once in a learning atmosphere that sets the goal of creating an effective and efficient learning process. Blended learning strategies provide opportunities for students to develop individual abilities without leaving social interactions in the classroom, so

that with this system students play more active role in learning while teachers as facilitators.

Based on the results of an interview conducted on April 24th 2019 with a biology teachers in grade X at SMA Negeri 21 Makassar showed that: (1) teachers allow students to access the internet in search of additional learning materials while in the classroom by the guidance of teachers, (2) teachers only use powerpoint (ppt) as media in which there are pictures and brief explanations of plants materials while other media in the form of e-learning have not been used, (3) teachers need reliable learning resources that can be used by students while at home. At SMA Negeri 21 Makassar have its own computer laboratory consist of 20 computer units, and wifi networks that can be accessed by teachers and students in schools.

Meanwhile, observations made through by distribution of questionnaires on April 24, 2019 to students of class X MIA 3 showed that: (1) students already have personal smartphones and laptops that can be used to access the internet, (2) students have data packages to access the internet and wifi networks at home, (3) students are proficient in operating computers, (4) students prefer to access the internet to find lesson materials and perform tasks provided by teachers, (5) students are interested and want to try to do online learning.

Plants material is one of the subjects in biology for grade X in semester two. Covered by basic competencies (KD) 3.8 applies classification principles to classify plants into division based on plant observations and metagenesis and relates their role in the survival of the world. While the development of blended learning can be a solution in supporting the creation of an effective, efficient, applicative and fun learning process especially seen from plants material that includes broad concepts and objects so that learning activities can be hampered by explanations that include: Plants divided into plants without vascular system and plants with vascular system. Plants without a vascular namely *Bryophytes*, while plants with a vascular system include seedless plants namely *Pteridophytes* and seeded plants namely: *Gymnosperm* and *Angiosperm*. Based on existing background, researchers are interested in developing of blended learning related to plants material.

CHAPTER II
LITERATURE REVIEW

A. Literature Review

1. Blended Learning

Blended Learning consists of two words, “Blended” and “Learning”. The word “Blended” means the formula of a combination or blend alignment, while “Learning” has a general meaning that is learning, thus at first glance contains the meaning of learning patterns containing elements of mixing, or merging between one pattern with another pattern. Blended Learning can be interpreted as a learning process that utilizes a variety of approaches. The approach can take advantage of a wide range of media and technology. Simply, Blended Learning is a learning that combines face-to-face (conventional learning, where students and educators interact directly with each other, each can exchange information about learning materials), self-learning (learning with various modules provided) and self-learning online (Prayitno & Widyaiswara, 2013).

According to Lestari & Susanti (2016), the blended learning strategy used a mixture of several approaches and combines several media to complement learning activities in shaping learning behavior. Learning using a blended learning strategy combines online and offline learning forms. Online learning means learning via the internet and offline occurs traditionally, namely face to face in class. In simple terms, it can be said that blended learning is learning that combines face-to-face (between students and teachers interacting directly), independent learning (learning with various modules that have been provided) and independent learning (online).

2. Electronic Learning

Web-based learning media related to electronic learning or often called e-learning as a form of distance education conducted through internet media. E-learning is a conventional form of learning that is poured in digital format through internet technology. Therefore, e-learning can be used in the distance education system as well as conventional education systems (Hanum, 2014).

Electronic learning can be synchronous (real-time) or asynchronous (flex-time). Synchronous e-learning includes technology such as video conferencing and electronic white boards requiring students to be present at the time of content delivery. Asynchronous applications include programmed instruction and tutorials that allow students to work through the screens at their own pace and at their own time. Most of the courses available on the Internet are based on this asynchronous model. Students can be involved in e-learning from distributed locations, as in distance learning, or from the same place, such as using a group support system in a classroom to work on an assignment. E-learning applications also differ in the levels of collaboration that they involve. Some courses are entirely independent and individual, while others incorporate some elements of group learning such as discussion forums or chat rooms. The mode of course delivery can be entirely electronic (with or without an instructor) or take a more blended approach integrating electronic and classroom delivery to varying extents. Many current e-learning offerings follow the latter mode, taking advantage of the benefits of various types of delivery (Wagner et al., 2008).

3. Schoology

Schoology, a collaboration and learning tool, is a web-based K-12 learning environment that will give students, parents, and teachers 24/7 access to class materials and information via the internet. *Schoology* is free and allows for teacher to teacher, teacher to student, and even student to student online collaboration in a user friendly and secure environment. It offers the possibilities of adopting this collaboration and learning tool to customize learning for each student (Sicat, 2015).

Schoology is a website that provides e-learning and social networking. The concept is the same as edmodo, but in terms of e-learning schoology has many advantages. Building e-learning with schoology is also more profitable when compared to using moodle that is because it does not require schoology hosting and management (more user friendly). Even the features are not as complete as moodle, but for online learning in schools is very adequate. The features of Schoology are

as follows: Courses, Group Discussion, Resources, Quiz, Attendance and Analytics (Aminoto, 2014).

The design of *Schoology* is parallel to that of *Facebook* in which conversations take place, messages are sent, statuses are updated and information and other media are shared within a classroom network. *Schoology* consists of two main contexts 1) interactive communication and 2) academic information exchange. Teachers can create discussion questions, collaborative groups, or boards for assignments that allow for dynamic interaction between students and their teachers (Sicat, 2015).

According to Juniarti (2014), there were five reasons why using Schoology include: (1) Schoology offers tools used by teachers to support online learning activities, (2) Schoology provides curricular "resources" and collaborative groups for students and teachers to build and engage in their personal learning networks, (3) Schoology can be run on any web browser, including on mobile applications such as android and iOS , (4) Schoology is an Application Programming Interface (API) which means that other applications can connect and interact with Schoology programs, such as google drive, twitter, and facebook, (5) It’s a free instructional component for teachers and students.

B. Conceptual Framework

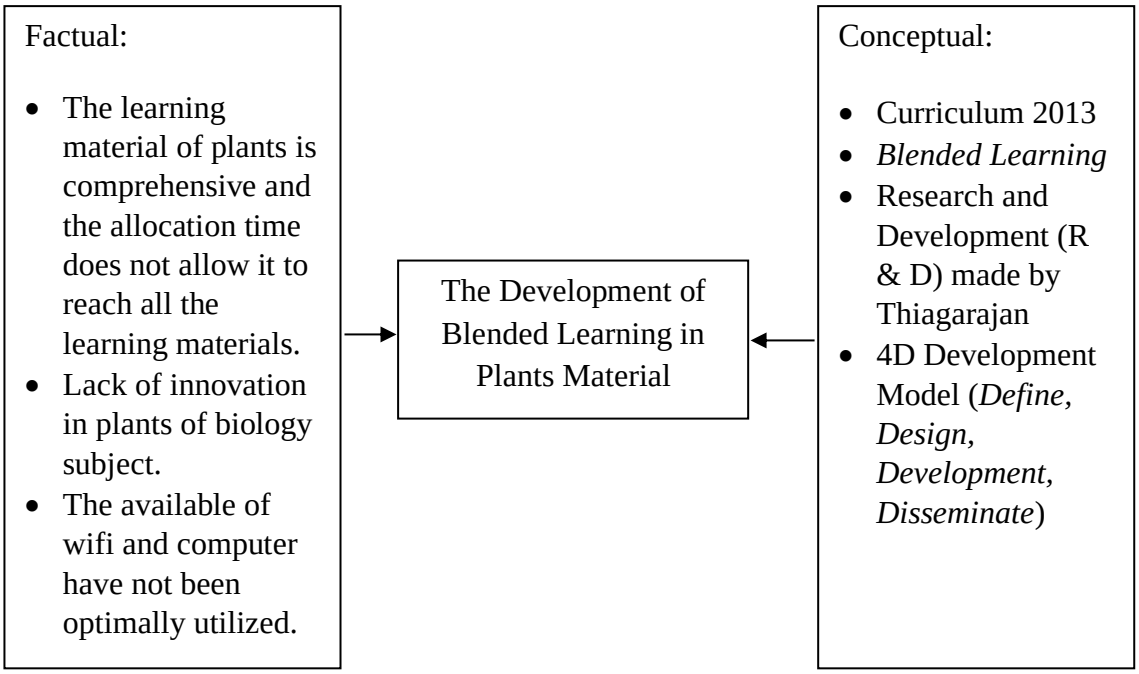


Figure 2. 1. Conceptual Framework Charts of The Development of *Blended Learning* in Plants Material for Grade X Senior High School

CHAPTER III
RESEARCH METHOD

A. Type of the Research

The research type is a Research and Development (R&D), namely the development of Blended Learning using the 4-D model made by Thiagarajan in 1974 which consists of 4 stages, namely Define, Design, Develop, and Disseminate towards students of class X SMA on the Plantae concept. The research was carried out until the develop stage, specifically limited trials.

B. Place and Time of the Research

The research was conducted at SMA Negeri 21 Makassar in the even semester of the 2019/2020 school year.

C. Research Subjects

The subjects of this research were students of class X MIA 3 at SMA Negeri 21 Makassar, and the biology teacher at SMA Negeri 21 Makassar.

D. Methods

This research uses a 4-D development model consisting of 4 stages, but the development of blended learning is only up to the development stage. The development steps will be carried out as follows.

1. Define

This stage is carried out to determine and identify teaching requirements, namely learning objectives and limitation of material made in accordance with the applicable curriculum. The steps are as follows:

Front – End Analysis

The initial analysis was done to find out the fundamental problems faced by teachers in the learning process, and then conducted an alternative search for better and efficient problem solving. Researchers conducted a literature and observation at SMA Negeri 21 Makassar.

Learner Analysis

Analysis of learner needs was done by collecting data related to learning problems experienced by learners including learning resources, learning media, and learning conditions. Analysis of learner needs was done by direct interviews with students and teachers and the distribution of questionnaires to students of grade X at SMA Negeri 21 Makassar.

Task Analysis

Task analysis aims to identify the skills and abilities that learners will gain after using the products they create. In addition, task analysis was done to determine the content in the learning unit by detailing the teaching material tasks that will be included in the content of blended learning products that was created.

Concept Analysis

Concept analysis aims to identify key parts of plants material that learners will learn. Adjusting each subject of plantae material that must be known by learners, so that the development of the content of the material was made become interesting and easy to understand. Concept analysis then arranged by systematically before import into the blended learning that was created.

Specifying Instructional Objectives

The specifications of learning objectives aim to summarize the results of task analysis and concept analysis to determine the learning objectives in accordance with the syllabus of curriculum 2013. Determining the learning objectives will give an overview of the learning objectives in developed of learning device and schoology.

2. Design

The design stage is a designing series of learning activities device in the form of a syllabus, lesson plans, student worksheets and schoology which are made as supporting products for blended learning. Before the product design continues to the next stage, the product design is checked by friends and supervisors. Based on the results of the inspection, it is possible that the product design still needs to be improved according to the recommendations.

Design of Learning Material

This stage is the stage that connects the define stage with the design stage. The design stage begins by analyzing the learning indicators that will be achieved by adjusting the subject matter to be included in the product made.

Media Selection

The media selection stage aims to identify the right media and adapted to the characteristics of the material as well as the results of analysis from the previous stage to be incorporated into the product made. Media used in accordance with the target of the product that can be used by teachers and learners.

Format Selection

The format selection stage in blended learning development is intended to design the content of the product was created. The selection of formats is adjusted to various factors such as the structure of the material components and the type of media used.

Initial Design

The initial design is the design all of learning devices and schoology that must be done before the trial.

3. Development

This stage, the final form of learning and schoology devices that previously went through the revision process based on input from experts and trial results data.

Expert Appraisal

Expert validation is a technique to validate or assess the feasibility of product design, this activity is evaluated by experts in their field. Expert appraisal consists of biologists, education experts, and educational practitioners. Expert appraisal assessment of learning devices includes: format, language, illustration and content. Based on input from experts, the learning materials are revised to make it more precise, effective, easy to use, and has a high quality of technique.

Developmental Testing

The revised learning devices and schoology were subsequently tested. The trial was conducted to obtain direct input in the form of responses, teacher response

on learning devices and schoology and the distribution of questionnaires for learners to know their response with the schoology. Trials and revisions continue until a valid and practical device was obtained.

E. Data Collection Techniques and Research Instruments

Data collection technique is a way of obtaining data or information from respondents using research instruments. The research instrument used consists of three, the first questionnaire is a questionnaire used to validate learning device and e-learning based schoology, the second questionnaire is a teacher response questionnaire used to test the practicality of learning device and e-learning based schoology, the third questionnaire is a learners response test the practicality of schoology.

F. Data Analysis Techniques

Data analysis techniques are used to process the results of research on blended learning development in high school X class plantae materials along with instruments that are valid and practical, namely by using descriptive statistical analysis.

1. Validty Test

The research results are valid if there is a similarity between the data collected and the data that actually occurs on the object under study. Valid means that the instrument can be used to measure what should be measured (Sugiyono, 2017).

According to Hobri (2010), the validity data of product were analyzed through the following process.

a. Recapitulate the validity rating result of learning devices and schoology into tables which include: a) rating results of the validator (V_{ji}), b) indicator (K_i), c) aspects (A_i)
b. Determine the average score of all validators for each indicator using the formula:

$$\overline{K_i} = \frac{\sum_{j=1}^{n} V_{ji}}{n}$$

Note:

$\overline{K_i}$ = average of indicator to-i,

V_{ji} = rating result of validator to- j of indicator to-i

n = total validator

c. Determine the average vault of each aspect using formula:

$$\overline{A_i} = \frac{\sum_{j=1}^{n} \overline{K}_{ji}}{n}$$

Note:

$\overline{A_i}$ = average of aspect to-i,

$\overline{K}_{ji}$ = average of aspect to-i indicator to-j,

n = total indicator of each aspect to-i

d. Determine the Va value or the total mean value for all aspects using formula:

$$V_a = \frac{\sum_{j=1}^{n} \overline{A_i}}{n}$$

Note:

V_a = total average,

$\overline{A_i}$ = aspect average to-i

n = total aspect

e. The Va value or total average value is referred to the interval determining the validity level of learning device and schoology as listed in Table 3.1.

Table 3. 1 Validity Interval

Interval Score	Validity Category
$V_a = 5$	Very valid
$4 \leq V_a < 5$	Valid
$3 \leq V_a < 4$	Enough valid
$2 \leq V_a < 3$	Less valid
$1 \leq V_a < 2$	Not valid

(Source, Hobri, 2010)

Note:

V_a is the value of determining the validity of learning device and schoology.

The criteria state that learning device and schoology have a degree of validity, if the minimum level of validity is achieving a validity level of $4 \leq V_a < 5$. If the level of validity achievement is not valid, it is necessary to revise based on the input (correction) of the validator. Further validation is carried out until a valid learning device and schoology is obtained.

2. Practical Test

Furthermore, a practicality test was carried out based on the responses of teachers and learners of grade X senior high school to learning device and schoology.

Determining the percentage of learners and teacher responses, it can be calculated using the formula according to Riduwan (2018), as follows.

$$\mathrm{P} = \frac{\sum_{i=1}^{5} x_i}{\sum_{j=1}^{5} x_j} \times 100\%$$

Note:

P : statement percentation

x_i : the assessment score by the respondent (teacher and/ learners)

x_j : the highest number of answer score

After calculating the percentage of learners or teachers who gave responses, then determine the response criteria that have been given to the percentage of practicality analysis results. As for how to determine the criteria for practicality based on the assessment guidelines according to Riduwan (2018), namely by matching the percentage results with the practicality interval presented in Table 3.2.

Tabel 3. 2 Practically Interval

Percetage (%)	Response Category
81 – 100	Very Positive
61 – 80	Positive
42 – 60	Enough Positive
21 – 40	Less Positive
0 – 20	Not Positive

(Source, Riduwan, 2018) (Modified)

Categorization of practicality of learning device and schoology to the percentage of assessment analysis results of learners and teachers refers to practicality percentage scores. The response results are said to meet the practicality criteria when the average value of all respondents' statements is 61-80% in the positive category.

CHAPTER IV
RESULT AND DISCUSSION

A. Result

1. Product Development

a. The Development of Learning Device and Schoology

The products in this development are learning tools in the form of a syllabus, lesson plan, student worksheets, and schoology as a support product for implementation of blended learning. The initial product is made based on the design stage before validation by the validator (expert appraisal). Learning tools and schoology underwent several changes after validation by validators.

1) Syllabus

Syllabus developed in biology subject especially in plants material for grade X Senior High School. In syllabus will included core competiencies, basic competencies, material, competence indicator, learning activities, assessment, time allocation, resources, tools that arranged based on material would be teached. Syllabus developed will be showed in Figure 4.1.

Kompetensi Dasar		Materi Pokok	Indikator Pencapaian Kompetensi	Kegiatan Pembelajaran	Penilaian			Alokasi Waktu	Sumber, dan Alat Belajar
					Teknik	Bentuk	Contoh		
	secara efektif dengan lingkungan sosial dan alam serta menempatkan diri sebagai cerminan bangsa dalam pergaulan dunia.	luar kelas	dan kerjasama yang baik selama kegiatan diskusi berlangsung	disiplin dan memiliki kerjasama yang baik dalam proses pembelajaran.					
3.8	Mengelompokkan tumbuhan ke dalam divisio berdasarkan ciri-ciri umum, serta mengaitkan peranannya dalam kehidupan	1. Ciri-ciri umum kingdom *plantae*. 2. Ciri-ciri tumbuhan lumut dan paku 3. Metagenesis tumbuhan lumut dan paku 4. Divisio tumbuhan lumut dan paku	**Pertemuan Pertama** 3.8.1 Menemukenali ciri-ciri umum kingdom *plantae*. 3.8.2 Menemukenali ciri-ciri tumbuhan lumut dan paku 3.8.3 Menjelaskan metagenesis tumbuhan lumut dan paku	• Peserta didik mengamati video kemudian mendiskusikan ciri-ciri kingdom plantae • Peserta didik membaca literatur kemudian mendiskusikan ciri-ciri tumbuhan lumut dan paku • Peserta didik membaca literatur kemudian mendiskusikan metagenesis	Tes	Pilihan Ganda	LP KD 3.8	3 JP (1x pertemuan)	**Sumber Belajar Pertemuan 1** • Buku biologi untuk kelas X kuri-kulum 2013 Edisi Revisi 2016 olehYusa dkk. • Majalah , dan buku

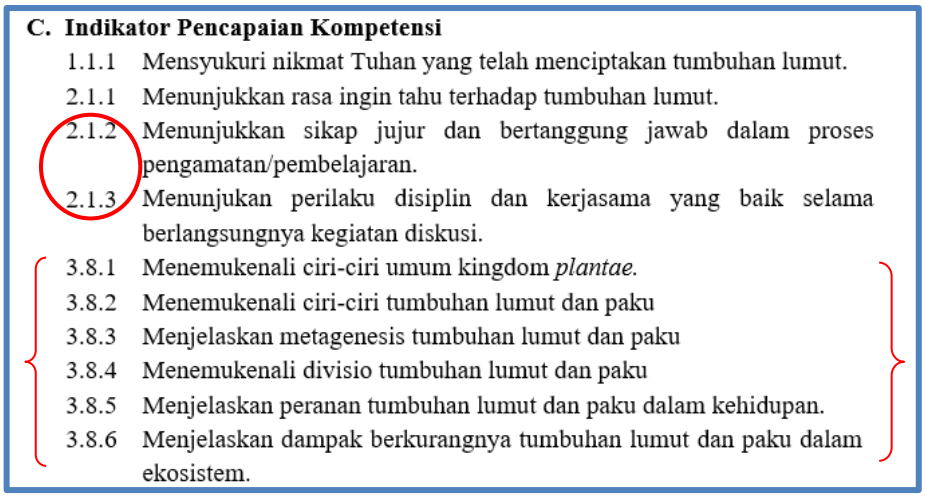
Figure 4. 1. Syllabus Learning

2) Lesson Plan

Lesson Plan is a description of the syllabus and as a reference for teachers to perform the teaching and learning activities so that they were more directed effectively and efficiently. The lesson plan was developed as follows.

a) Competence Indicator

The development of competence indicators from the lesson plan is a form of specific basic competencies so that it can be used to assess the achievement of learning outcomes and a measure for student have mastered the plants material. The competence indicators were developed shown in Figure 4.2.



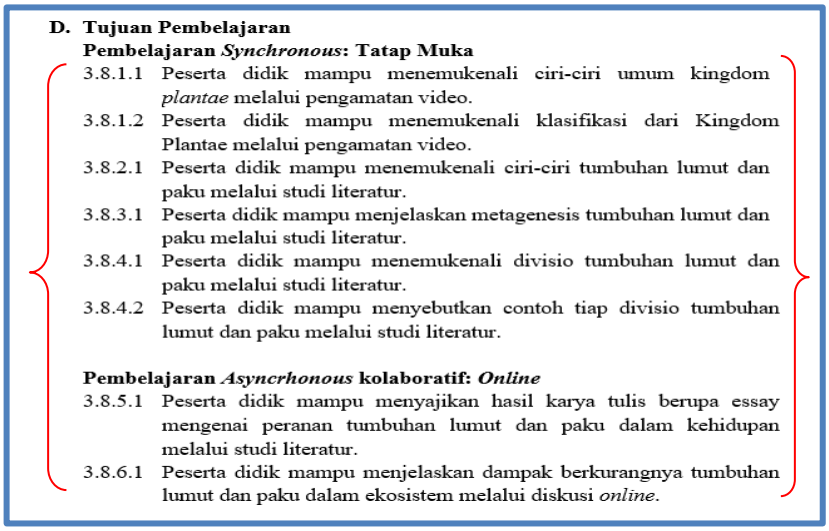
C. Indikator Pencapaian Kompetensi

1.1.1 Mensyukuri nikmat Tuhan yang telah menciptakan tumbuhan lumut.
2.1.1 Menunjukkan rasa ingin tahu terhadap tumbuhan lumut.
2.1.2 Menunjukkan sikap jujur dan bertanggung jawab dalam proses pengamatan/pembelajaran.
2.1.3 Menunjukan perilaku disiplin dan kerjasama yang baik selama berlangsungnya kegiatan diskusi.
3.8.1 Menemukenali ciri-ciri umum kingdom *plantae.*
3.8.2 Menemukenali ciri-ciri tumbuhan lumut dan paku
3.8.3 Menjelaskan metagenesis tumbuhan lumut dan paku
3.8.4 Menemukenali divisio tumbuhan lumut dan paku
3.8.5 Menjelaskan peranan tumbuhan lumut dan paku dalam kehidupan.
3.8.6 Menjelaskan dampak berkurangnya tumbuhan lumut dan paku dalam ekosistem.

Figure 4. 2. Competence Indicator

b) Learning Outcome

Learning objectives are goals to be achieved or expected during the learning process based on competence indicators. The learning objectives of the lesson plan are shown in Figure 4.3.



D. Tujuan Pembelajaran

Pembelajaran *Synchronous*: Tatap Muka

3.8.1.1 Peserta didik mampu menemukenali ciri-ciri umum kingdom *plantae* melalui pengamatan video.

3.8.1.2 Peserta didik mampu menemukenali klasifikasi dari Kingdom Plantae melalui pengamatan video.

3.8.2.1 Peserta didik mampu menemukenali ciri-ciri tumbuhan lumut dan paku melalui studi literatur.

3.8.3.1 Peserta didik mampu menjelaskan metagenesis tumbuhan lumut dan paku melalui studi literatur.

3.8.4.1 Peserta didik mampu menemukenali divisio tumbuhan lumut dan paku melalui studi literatur.

3.8.4.2 Peserta didik mampu menyebutkan contoh tiap divisio tumbuhan lumut dan paku melalui studi literatur.

Pembelajaran *Asyncrhonous* kolaboratif: *Online*

3.8.5.1 Peserta didik mampu menyajikan hasil karya tulis berupa essay mengenai peranan tumbuhan lumut dan paku dalam kehidupan melalui studi literatur.

3.8.6.1 Peserta didik mampu menjelaskan dampak berkurangnya tumbuhan lumut dan paku dalam ekosistem melalui diskusi *online*.

Figure 4. 3. Learning Outcome

c) Learning Materials

Learning material from the lesson plans developed is adjusted with the basic competencies of plants material. The learning materials from the lesson plans are shown in Figure 4.4.

E. Materi Pembelajaran

Ciri tumbuhan (**plantae**) yang membedakannya dengan kelompok makhluk hidup yang lain adalah sel penyusun tubuhnya mengandung kloroplas. **Kloroplas** memungkinkan tumbuhan membuat makanannya sendiri melalui fotosintesis. Karenanya tumbuhan bersifat **autotrof**. Secara umum, struktur tubuh tumbuhan terdiri atas akar, batang, dan daun.

Tumbuhan Lumut (***Bryophyta***) merupakan keturunan terdekat dari tanaman darat pertama. Tanaman dalam kelompok ini juga disebut tumbuhan tidak berpembuluh (***non-tracheophyta***) karena kekurangan sel transpor turunan disebut trakeid, tidak memiliki akar, batang, dan daun sejati. Lumut dianggap sebagai peralihan antara tumbuhan talus (***Thallophyta***) dan kormus (***Cormophyta***). Lumut dikelompokkan menjadi tiga divisi, yaitu ***Bryophyta***, ***Hepatophyta***, dan ***Anthocerophyta***.

Sumber: www.plantam.com
Gambar 1.1
Tumbuhan lumut menempati berbagai habitat misalnya hutan.

Tumbuhan berpembuluh (***Trachеo-phyta***) merupakan tumbuhan yang sudah memiliki pembuluh pengangkut. Anggota tumbuhan berpembuluh tidak berbiji adalah tumbuhan paku (***Pteridophyta***). Tumbuhan paku sudah termasuk ke dalam tumbuhan kormus (***Cormophyta***) karena sudah memiliki akar, batang, dan daun yang jelas. Berdasarkan klasifikasi terbaru, tumbuhan paku dibagi menjadi dua divisi, yaitu ***Lycophyta*** dan ***Pterophyta***.

Sumber: www.thespruce.com
Gambar 1.2
Tumbuhan paku sering ditemui tumbuh secara liar menempel di dinding, di selokan, maupun di pohon

Figure 4. 4. Learning Material of Plants

3) Student Worksheet

Student worksheets contain questions, instructions or steps to complete a task in the form of both cognitive aspects and practicum activities given by the teacher. Student worksheet can help students to find a concept and activate students in the learning process. The developed of student worksheet was shown in Figure 4.5.

Figure 4. 5. Student Worksheet

4) *Schoology*

Schoology was developed as a complement of face-to-face learning in the classroom to support the online learning process. Schoology can be accessed via https://schoology.com/. The development of schoology needs to pay attention to the display design of the course, and the display design of the learning resources.

a) The Front Display of Course in Schoology

Each online learning course through schoology provides learning resources and learning activities. The front page view of the course is shown in Figure 4.6.

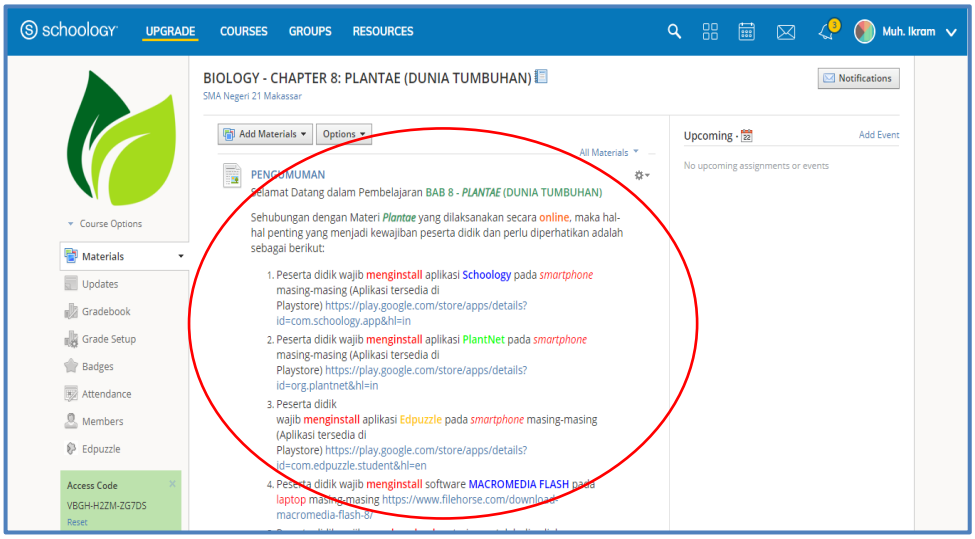


Figure 4. 6. The Front Display of Course in Schoology

b) The Display of Material *Course*

The display of material course displays a learning device folders and a folders for each meeting that can be accessed by students when learning online in schoology. The display of material course was shown in Figure 4.7.

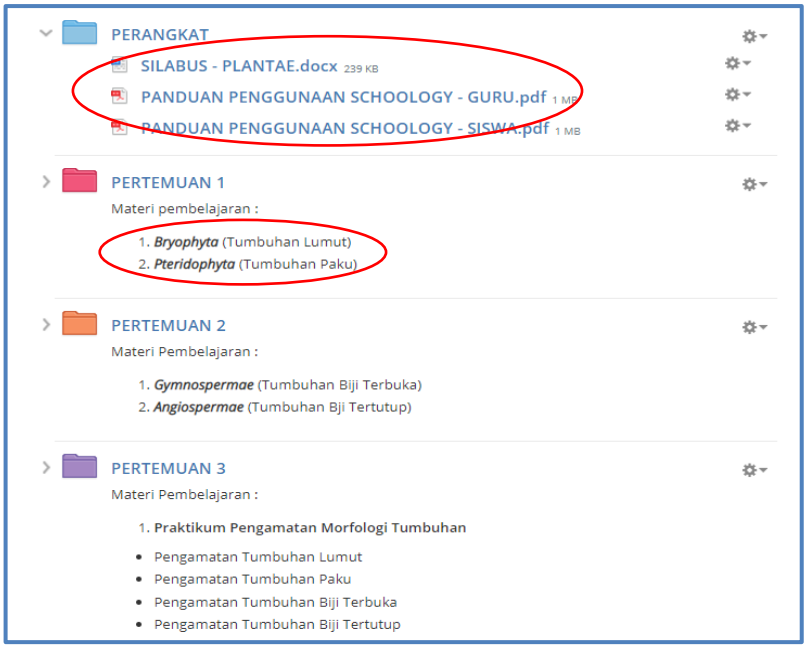


Figure 4. 7. The Display of Material Course

c) The Display of Learning Resources and Learning Activities in Course

The Learning resources and learning activities are facilities available in course that can be accessed by students when online learning. The display of learning resources and learning activities in the course can be seen in Figure 4.8.

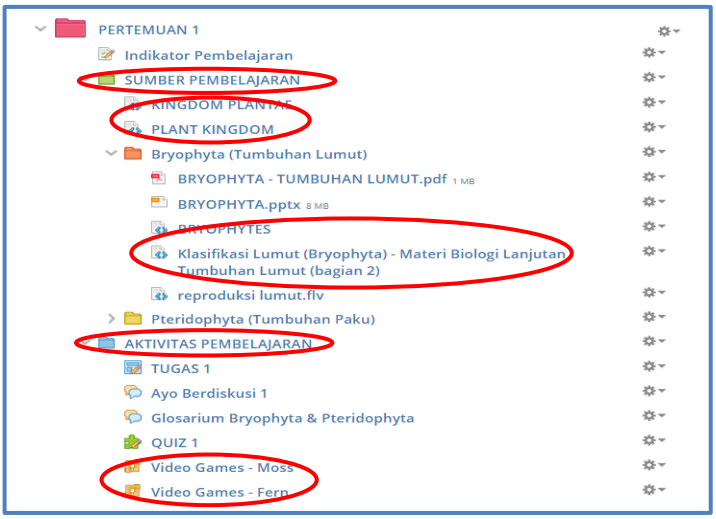


Figure 4. 8. The Display of Learning Resources and Learning Activities

d) The Display of Module

One of the learning resources provided in the course is a module in the form of a portable document format (PDF). The module developed by researchers with the aim of students being able to learn independently without teacher guidance. The module was shown in Figure 4.9.

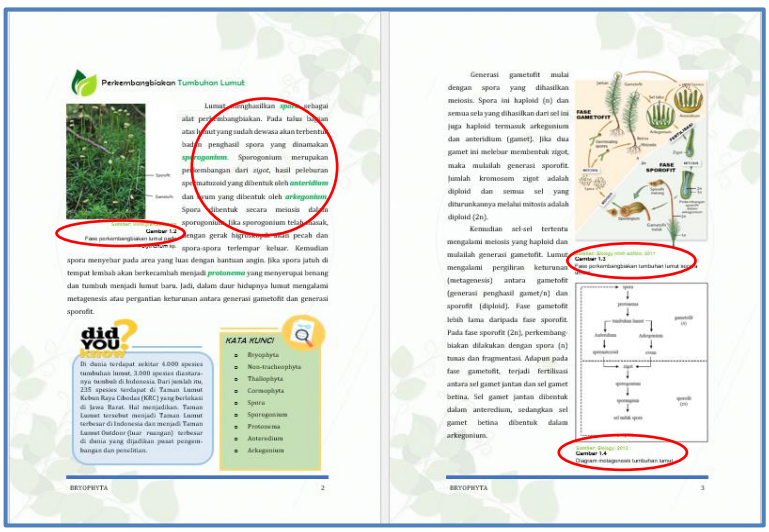


Figure 4. 9. Tampilan Modul dalam *Course* Setelah Revisi

b. The Validity Test and Practically Test

Development of blended learning on plants material for grade X senior high school which includes the development of learning device in the form of a syllabus, lesson plans, student worksheets, and schoology that has been made, which will then be assessed by two expert appraisal to determine the validity value. The research instrument used consisted of validation instruments to test the validity of products by expert appraisal and practical instruments to test the practicality of the products consisting of teacher response questionnaires and student response questionnaires. The type of questionnaire used in this study was a closed questionnaire with a Likert scale. The Likert scale is a scale for assessing something that has tiered choices, so that respondents only put a checklist on the questionnaire given.

The validity test is carried out using validity instruments that have been made to assess products in the form of learning device and schoology as supporting products for blended learning. The validation instrument used consists of 4 parts, namely: 1) the syllabus validation instrument sheet, 2) the learning lesson plan validation instrument sheet, 3) the student worksheet validation instrument sheet, and 4) the schoology validation instrument sheet. The validation instrument is equipped with 5 rating scales, namely a score one for a very bad rating, a score two for a bad rating, a score three for a moderate rating, a score four for a good rating, and a score five for a very good assessment.

The practicality test was carried out using the practicality instrument used consisting of teacher response questionnaires and student response questionnaires. Teacher response questionnaires were distributed to assess the practicality of learning device and schoology, while student response questionnaires were distributed to assess the practicality of schoology. The practicality instrument is equipped with 5 rating scales, namely a score of one for the assessment of strongly disagree, a score of two for the assessment of disagree, a score of three for a neutral assessment, a score of four for an agreed assessment, and a score of five. for the assessment strongly agree. Each of the free test questionnaires has a different aspect of assessment and is adjusted to the product to be assessed.

1) The Validity Test of Learning Devices and Schoology

The validity test is carried out on learning device consist of a syllabus, lesson plan, student worksheet, and schoology. The results of data analysis obtained are as follows.

a) The Validity Test of Syllabus

The assessment of syllabus is carried out by expert validators filling out the validation instrument sheet. The results of the validity test based on the analysis of the syllabus validation instrument sheet can be seen in Table 4.1.

Table 4. 1. The Validator Assessment of Syllabus

No.	Rated Aspect	$\overline{K_i}$	$\overline{A_i}$	Notes
I	**Contents Served**			
	1. Assessing the relation between Core Competencies (CC) and Basic Competencies (BC).	4.5	4.5	Valid
	2. Identifying material that support the achievement of Basic Competencies.	4		
	3. The depth of material.	4.5		
	4. The selection of teaching material.	4.5		
	5. The learning activities were designed and developed based on CC, BC and student potentials.	4		
	6. Formulate the competence indicator.	5		
	7. Determine the learning resources that were customized to CC, BC, as well as the main subjects, learning activities, and competence indicator.	4.5		
	8. Determine the assessment types.	5		
II	**Language**			
	1. Using a language which accordance with Indonesian Language Rules.	4.5	4.5	Valid
	2. Simplicity of sentence structure.	4.5		
III	**Time**			
	1. Suitability with the time allocation.	4.5	4.5	Valid
	2. The choice of time allocation based on basic competence.	4.5		
	Average (V_a)		**4.5**	**Valid**

Table 4.1 shows the average score of the content served aspects is 4.5; language aspect is 4,5; and time aspect is 4,5. So, the validity value of syllabus is 4.5. The validity Category $4 \leq V_a$ <5 means that the syllabus is valid.

b) The Validity Test of Lesson Plan

The results of the validity test based on the analysis of the lesson plan validation instrument sheet can be seen at Table 4.2.

Table 4. 2. The Validator Assessment of Lesson Plan

No.	Rated aspect	$\overline{K_i}$	$\overline{A_i}$	Notes
I	**The Formulation of Learning Objectives**			
	1. The clarity of core competencies and basic competencies	5	4.62	Valid
	2. The correspondence of core competencies and basic competencies with learning objectives.	4.5		
	3. The accuracy of explanation the basic competencies into indicators.	4.5		
	4. The suitability of indicator with the learning objectives.	4.5		
II	**Contents served**			
	1. The systematics preparation of lesson plans.	5	4.5	Valid
	2. The suitability sequence of learning activities in plants material.	4.5		
	3. The clarity of student / teacher activities for each learning stage in plants material (preliminary, core, and closing activities).	4		
	4. The clarity of learning resources (the learning resources were written clearly, including reference, media, tools, and materials).	4.5		
III	**Language**			
	1. Using a language which accordance with Indonesian Language Rules.	4.5	4.5	Valid
	2. Using communicative language.	4.5		
	3. The simplicity of sentence structure.	4.5		
IV	**Time**			
	1. Suitability with the time allocation.	4.5	4.5	Valid
	2. The time details for each learning stage were clear.	4.5		
	Average (V_a)		**4.52**	**Valid**

Table 4.2 shows the average score in the formulation of learning objectives aspects is 4.62; content served aspects is 4.5; language aspect is 4,5; and the time aspect is 4.5. So, the validity value of lesson plan is 4.52. The validity Category 4 ≤ V_a<5 means that the lesson plan is valid.

c) Validity Test of Student worksheet

The results of the validity test based on the analysis of the student worksheet instrument can be seen at Table 4.3.

Table 4. 3. Validator Assessment of Student Worksheet

No.	Rated aspect	$\overline{K_i}$	Notes
1.	Completeness of components / structure of student worksheet consisting of titles, basic competencies, competency indicators, learning objectives, work instructions, and questions.	4.5	Valid
2.	The suitability of the formulation of competency indicators with the description of the questions in the student worksheet.	4.5	Valid
3.	The clarity of the description of the questions on the student worksheet (the description of the questions does not cause multiple interpretations).	4.5	Valid
4.	The description of the question uses a command word that demands an answer to the description.	4.5	Valid
5.	The accuracy using of terms, grammar and spelling in accordance with good and correct Indonesian language rules.	5	Valid
	$\overline{A_i}$	**4,6**	**Valid**
	Average (V_a)	**4,6**	**Valid**

Table 4.3 shows the average validity score of the student worksheet is 4.6. The validity Category 4 ≤ V_a<5 means that student worksheet is valid.

d) The Validity Test of Schoology

The results of the validity test based on the analysis of the schoology instrument sheet can be seen at Table 4.4.

Table 4. 4. Validator Assessment of Schoology

No.	Rated Aspect	$\overline{K_i}$	$\overline{A_i}$	Notes
I	**Learning Course**			
	1. To include a syllabus.	5	5	Valid
	2. To include a indicator for each meeting.	5		
	3. To include the title of material.	5		
	4. To include a learning material in the form of:			
	a. Modul (PDF files)	5		
	b. Powerpoint	5		
	c. Video	5		
	5. To include a learning facilities in the form of:			
	a. Assignment	5		
	b. “Ayo Diskusi” Forum	5		
	c. Glossary	5		
	d. Quiz	5		
	e. Video Games	5		
	6. To include a schoology instructions.	5		
II	**Eligibility Content**			
	1. The suitability of indicators with basic competencies.	4.5	4.57	Valid
	2. The suitability of material with indicators.	4.5		
	3. The accuracy of material	4.5		
	4. The material served in schoology was developed coherently.	4.5		
	5. The difficulty level accordance with the development stage of students.	4.5		
	6. The suitability of powerpoint to the material.	4.5		
	7. The suitability of video to clarify the material.	5		
III	**Display**			
	1. The consistent of background.	4.5	4,7	Valid
	2. The consistent of font size and font types.	4.5		
	3. Layout accuracy.	4.5		
	4. Learning media looked interesting.	5		
	5. The consistent of colour.	5		
IV	**Operation**			
	1. Schoology easy to operate.	5	4,3	Valid
	2. There were no system barriers while using schoology.	4		
	3. All content can be accessed properly.	4.5		
	4. Doesn’t take a long duration to load schoology pages.	4		
	5. The operation depends on internet network.	4		
V	**Language**			
	1. Using a language which accordance with Indonesian Language Rules.	4.5	4.5	Valid
	2. Using a simple language and easy to understand.	4.5		
	3. Using a language that didn’t have multiple meanings.	4.5		

VI	**Software engineering**			
	1. Usability (easy to use and simple to operate).	4.5	4.12	Valid
	2. Compatibility (learning media can be run on various hardware).	4		
	3. Reusability (can be used again to develop the learning media).	4		
	4. The accuracy of selecting the type of application / software / tools for development.	4		
	Average (V_a)		**4.53**	**Valid**

Table 4.4 shows the average score on the learning served is 5; eligibility content is 4,57; display is 4,7; operation is 4,3; language is 4,5; and software engineering aspects is 4.12. So, the value of the schoology validity results is 4.53. The validity Category $4 \leq V_a < 5$ means that the schoology is valid.

2) The Practicality Test of Learning Tool and Schoology

The practicality test was carried out on learning devices consisting of a syllabus, lesson plan (RPP), student worksheet (LKPD), and schoology that had been declared valid by expert validators.

a) Teacher Response

The practicality test results assessed by the practitioner validator, in this case, the biology teacher, obtained an average percentage of practicality values which can be seen in Table 4.21 and Table 4.22.

Table 4. 5. Teacher Assessment of Learning Devices

No.	Rated aspect	Average of Aspect (x_i)	Top Score of Aspect (x_j)	Percentage of Aspects (%)	Response Category
1.	Syllabus	59	60	98.33	Very positive
2.	Lesson Plan	60	65	92.30	Very positive
3.	Student Worksheet	21	25	84	Very positive

Table 4.5 shows the practicality percentage of learning devices as a support for blended learning. The percentage of teacher responses to the syllabus is 98.33%, the lesson plan is 92.30%, and the student worksheet is 84%. Practicality Category

80% - 100% means that the teacher response to the learning device in the very positive response category.

Table 4. 6 Teachers Assessment of Schoology

Rated aspect	Average of Aspect (x_i)	Highest Score Aspect (x_j)	Percentage of Aspect (%)	Response Category
Learning Service Aspect	60	60	100%	Very Positive
Content Served Aspects	28	35	80%	Positive
Display Aspect	10	10	100%	Very Positive
Operating Aspect	20	25	80%	Positive
Language Aspect	12	15	80%	Positive
Software Availability Aspect	20	20	100%	Very Positive
Total Percentage / Aspect			**540%**	
Teacher Response Percentage			**90%**	**Very Positive**

Table 4.6 shows the practicality percentage of schoology as a support for blendend learning is 90%. The 81% - 100% practicality criterion means that the biology teacher response to schoology is in the very positive response category.

b) Students Response

The schoology practicality test assessed by students of grade X Senior High School is shown in Table 4.7.

Table 4. 7. Students Assessment of Schoology Practicality

Rated Aspect	Average of Aspect (x_i)	Highest Score Aspect (x_j)	Percentage of Aspect (%)	Response Category
Learning Service Aspect	1,098	1,485	73.94%	Positive
Display Aspect	245	330	74.24%	Positive
Operating Aspect	756	990	76.36%	Positive
Language Aspect	383	495	77.37%	Positive
Software Availability Aspect	502	660	76.06%	Positive
Total Percentage / Aspect			**377.97%**	
Percentage of Students Response			**75.59%**	Positive

Table 4.7 shows the practicality percentage of schoology as a support for blended learning is 75.59%. The practicality Category of 60% - 79% means that students' responses to schoology is in the positive response category.

B. Discussion

The development of blended learning that has been carried out refers to the four D (4-D) development model consisting of 4 stages, namely Define, Design, Develop, and Disseminate. With the limitations of the researchers, the development of blended learning on this plants material only reached the develop stage, namely limited trials.

1. Validity Test

The validation of learning device and schoology as support for blended learning was carried out by experts appraisal from the Biology Department, Faculty of Mathematics and Natural Sciences, UNM by seeing and assessing the learning device and schoology had been made, then providing a value on the validation sheet instrument. The validity of learning device and schoology is a requirement that must be met before a limited trial is carried out on research subjects. There are four validation instruments to assess the feasibility of a product made in the form of a syllabus validation instrument, lesson plan validation instrument, student worksheet validation instrument, and schoology validation instrument.

Referring to the results of the syllabus validation analysis in Table 4.1 which shows that the total validity average in all aspects of the assessment for the validity test of the syllabus, namely Va = 4.5, is in the range4 $\leq V_a$ <5 categorized as valid. This category states that the syllabus created is feasible to use. Syllabus as a reference for implementing blended learning to teach plants material.

Based on the results of the analysis of the validation of the lesson plan in Table 4.2 which shows that the total validity average in all aspects of the assessment for the lesson plan validity test, namely Va = 4.52 is in the range $4 \leq V_a < 5$ categorized as valid. This category states that the syllabus created is feasible to use. The characteristics of the lesson plans that are made can be seen from offline and online learning activities reflected in learning activities.

The student worksheet that was made has been validated by two expert validators, this refers to the results of the student worksheet validation analysis in table 4.3 shows that the total validity average in all aspects of the assessment for

the student worksheet validity test, namely Va = 4.6, is in the range 4 ≤V_a <5 categorized as valid. Through learning in the classroom, teachers as educators can transfer knowledge and skills that can activate students through working on student worksheet.

Electronic learning which is used for online learning is schoology. The schoology used in this research can be used as a medium and learning resource that students can access themselves to do online learning. Referring to the results of the schoology validation analysis in Table 4.4 shows that the total validity average in all aspects of the assessment for the schoology validity test, namely Va = 4.53 is in the range4 ≤ <5 $V_a$categorized as valid. This category states that the schoology developed is feasible to use.

In general, learning device and schoology has been made are included in the "valid" category, where the total average value for all assessment of leaning device can be seen in Table 4.1, Table 4.2, Table 4.3, and Table 4.4. Based on the validity Category, it can be said that learning device and schoology have a good degree of validity in the category and are feasible to use. This is supported by the theory put forward by Hobri (2010), the learning device has a good degree of validity, if the minimum level of validity achieved is the valid level (4 ≤ Va <5). If the level of attainment of validity is below valid, it is necessary to revise it based on suggestions (corrections) from the validator.

2. Practical Test

The development of blended learning resulted in products in the form of learning device and schoology as a support for the implementation of blended learning, but before it is applied in schools, the level of practicality must be known. Knowing whether or not the learning device and schoology are practical to support this blended learning, an assessment instrument is designed to test the practicality of learning device and schoology.

This practicality test was carried out by distributing response questionnaires to 1 biology teacher and 33 students from SMA Negeri 21 Makassar to find out their responses to development products. The questionnaire is filled in according to

the quality of the product produced. The results of this practicality test were then analyzed and obtained the percentage of practicality of learning devices and schoology that were made to support blended learning. Analysis of the results of teacher responses can be seen in Table 4.5 which shows the percentage of response to the syllabus is 98.33%, the lesson plan is 92.31%, the student worksheet is 84%, while the analysis of the results of the teacher's response to schoology can be seen Table 4.6 shows the percentage of 90%. The data obtained is based on the analysis of the results of the teacher's response data to the learning device and schoology made in the very positive category. Based on Table 4.7 the analysis of the results of the student response questionnaire data for the schoology practicality test shows a percentage of 75.59%. The data obtained were based on the analysis of the results of student response data to schoology in the positive category. Both the results of the analysis of the teacher's response and the students' responses show very positive response categories and positive responses, which means that blended learning can be well received by teachers and student. The data obtained were based on the analysis of the results of student response data to schoology in the positive category. Both the results of the analysis of the teacher's response and the students' responses show very positive response categories and positive responses, which means that blended learning can be well received by teachers and student. The data obtained were based on the analysis of the results of students response data to schoology in the positive category. Both the results of the analysis of the teacher's response and the students' responses show very positive response categories and positive responses, which means that blended learning can be well received by teachers and student.

CHAPTER V

CONCLUSSION AND RECOMMENDATION

A. Concussion

Based on the research results and discussion, it can be concluded that, the development of blended learning in plantae material for grade X senior high school is valid. Data analysis of average validity score of learning devices in the form of learning syllabus, lesson plan and learner worksheet and schoology obtained were into the valid category ($4 \leq V\_a < 5$). The development of blended learning in plantae material for grade X senior high school is practical. Analysis of the average practicality score of the teacher response based on questionnaire result has a practicality interval of 80% - 100% in the very positive category. Analysis of the average practicality score of the learner response based on questionnaireresult has a practicality interval of 66% - 79% in the positive category.

B. Recommendation

1. It is expected that the learning devices in the form of syllabus, lesson and learner worksheet can be used as one of the supporting learning in schools, especially in the lessons of biology plants material.
2. It is expected that schoology can be used as one of the learning resources and independent learning media for learners that can be used anywhere and anytime.
3. It is expected that there will be further development, to the disseminate stage and test the effectiveness of blended learning in plants material for grade X senior high school.

REFERENCES

Aminoto, T. (2014). Penerapan media e-learning berbasis schoology untuk meningkatkan aktivitas dan hasil belajar materi usaha dan energi di kelas xi sma n 10 kota jambi. *Sainmatika: Jurnal Sains Dan Matematika Universitas Jambi*, *8*(1), 221167.

Hanum, F. F. (2014). *Pengembangan Media Pembelajaran Berbasis Web Untuk Mata Pelajaran Pendidikan Kewarganegaraan (PKN) Di SMA Negeri 1 Banguntapan*. *Jurnal Pendidikan Kewarganegaraan*. UNY.

Hobri. (2010). Meto*dologi Penelitian Pengembangan (Development Research) Aplikasi pada Penelitian Pendidikan Matematika*. Jember: Pena Salsabila.

Lestari, D., & Susanti, R. (2016). Pengembangan Perangkat *Blended Learning* Sistem Saraf Manusia Untuk Meningkatkan Keterampilan Berpikir Kritis. *Journal of Innovative Science Education*, *5*(1), 83–93.

Prayitno, W., & Widyaiswara, L. (2013). Implementasi *Blended Learning* Dalam Pembelajaran Pada Pendidikan Dasar dan Menengah.

Riduwan. (2018). *Pengembangan Model Pembelajaran* (11th ed.). Bandung: Alfabeta.

Sicat, A. S. (2015). Enhancing college students' proficiency in business writing via schoology. *International Journal of Education and Research*, *3*(1), 159–178. htpp://ijern.com

Sugiyono. (2017). Metode Penelitian Pendidikan. Bandung: Alfabeta

Sulvianti, R., Hariani, S. A., & Asiyah, I. N. (2014). Pengembangan Bahan Ajar Biologi Berbasis Model Problem Based Learning (PBL) Pada Pokok Bahasan Dunia Tumbuhan (Plantae) Kelas X SMA Negeri 1 Jenggawah. *Jurnal Edukasi*, *1*(1), 36–41.

Thiagarajan, S. (1974). *Instructional Development for Training Teachers of Exceptional Children: A Sourcebook.* (First). Minneapolis, Minnesota: ERIC.

Wagner, N. L., Hassanein, K., & Head, M. M. (2008). Who is responsible for e-learning success in higher education? A stakeholders' analysis. *Educational Technology & Society*, *11*(3), 26–36.